

**I CLAIM:**

1. A receptacle for supporting a breast during ultrasonic scanning comprising:

a contoured cup made of material that is substantially transparent to acoustical energy and having an open end into which the breast may be inserted and a narrowed end configured to receive the nipple of the breast; and

spaced-apart elongated members, each made of material that is not substantially transparent to acoustical energy and each being mechanically coupled to the cup.

2. The receptacle of Claim 2 wherein at least some of the elongated members are substantially straight.

3. The receptacle of Claim 2 wherein each substantially straight member is mechanically coupled to the open end and to the narrowed end of the cup.

4. The receptacle of Claim 3 wherein each substantially straight member is also mechanically coupled to the cup at a point that is approximately midway between the open end and the narrowed end.

5. The receptacle of Claim 2 wherein each straight member is mechanically coupled to the narrowed end by a substantially rigid spacer.

6. The receptacle of Claim 3 wherein the scanning creates a set of substantially parallel coronal planes and wherein each substantially-straight member is substantially perpendicular to the coronal planes.

7. The receptacle of Claim 3 wherein the cup is substantially symmetrical about an axis and wherein each substantially straight member is substantially parallel to the axis.

8. The receptacle of Claim 1 wherein at least some of the elongated members are contoured.

9. The receptacle of Claim 8 wherein the contour of each contoured member is substantially the same as the contour of the cup.

10. The receptacle of Claim 9 wherein each contoured member is matingly affixed to the contour of the cup.

11. The receptacle of Claim 1 wherein at least some of the elongated members are substantially straight and wherein at least some of the elongated members are contoured.

12. The receptacle of Claim 11 wherein the cup is substantially symmetrical about an axis, wherein each substantially straight member intersects an end point of a line segment that is perpendicular to and passes through the axis, and wherein a contoured member intersects the other end point of the line segment.

13. The receptacle of Claim 12 wherein there are an equal number of substantially straight and contoured members.

14. The receptacle of Claim 11 wherein the substantially straight members and the contoured members are arranged in an alternating sequence.

15. The receptacle of Claim 1 wherein the spacing between each neighboring pair of elongated members is substantially equally.

16. A receptacle for supporting a breast during ultrasonic scanning comprising a contoured cup configured to snugly fit over the breast without stretching significantly and being made of a material that does not leak fluid and is substantially transparent to acoustical energy.

17. The receptacle of Claim 16 wherein the contoured cup includes an elastic polymer.

18. The receptacle of Claim 17 wherein the elastic polymer includes latex.

19. The receptacle of Claim 16 further including an acoustically conductive material on the inside of the cup.

20. The receptacle of Claim 17 wherein the acoustically conductive material includes a viscous gel.

21. A receptacle for insertion through an opening in an ultrasonic scanner and for supporting a breast during scanning comprising:

a contoured cup made of material that is substantially transparent to acoustical energy and having an open end into which the breast may be inserted and a narrowed end configured to receive the nipple of the breast; and

an annular ring mechanically coupled to the open end of the cup and configured to releasably engage the opening in the ultrasonic scanner.

22. The receptacle of Claim 21 wherein the annular ring has a surface that is substantially perpendicular to the contour of the cup at the open end.

23. The receptacle of Claim 21 wherein the diameter of the open end of the cup is slightly less than the diameter of the opening in the ultrasonic scanner and wherein the outer diameter of the annular ring is greater than the diameter of the opening in the ultrasonic scanner.

24. The receptacle of Claim 21 wherein the annular ring is flat.

25. An ultrasonic scanner for scanning a breast comprising:

a rotatable mechanism configured to rotate around the breast;

at least one ultrasonic transducer mechanically coupled to the rotatable mechanism; and

a pump configured to cause fluid to flow across the surface of the breast or the surface of a contoured cup in which the breast is inserted as the rotatable mechanism rotates from approximately the portion of the breast or cup that is closest to the chest to approximately the nipple of the breast or portion of the cup that surrounds it.

26. The ultrasonic scanner of Claim 25 wherein the pump includes a rotatable chamber and a substantially helical groove on the inner wall of the rotatable chamber.

27. An ultrasonic scanner for scanning a breast comprising:

a rotatable chamber configured to rotate around the breast;

at least one ultrasonic transducer mechanically coupled to the rotatable mechanism and having an acoustic impedance;

fluid within the rotatable chamber having an acoustic impedance substantially the same as the ultrasonic transducer;

a contoured cup configured to contain the breast and having an acoustic impedance substantially the same as the ultrasonic transducer; and

gel on the inside of the cup having an acoustic impedance substantially the same as the ultrasonic transducer.

28. An ultrasonic scanner having a tabletop, an opening in the tabletop configured to accommodate a breast, and a contoured surface surrounding the opening configured to substantially match the curvature of portions of the chest of a patient.